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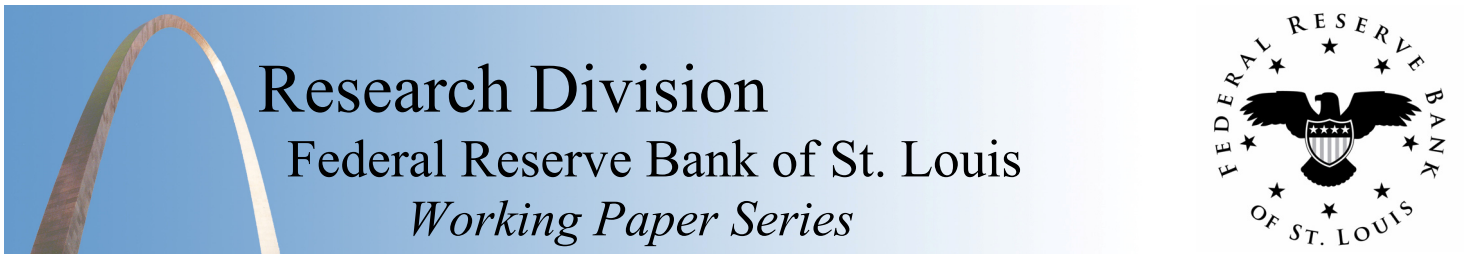


# Corporate Response to Distress: Evidence from the Asian Financial Crisis

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# CORPORATE RESPONSE TO DISTRESS:

# EVIDENCE FROM THE ASIAN FINANCIAL CRISIS

Mara Faccio and Rajdeep Sengupta [*]

July 2006

**Abstract**

This paper provides a comprehensive examination of the ways in which companies respond to a country-wide crisis through the restructuring of their assets (through asset sales, mergers or liquidations) or liabilities. We find the restructuring of liabilities to be the most common type of response. On the other hand, we argue that firms may be reluctant to engage in major asset sales due to substantial price discounts that need to be applied to these transactions during the crisis. In fact, we document that transaction multiples dropped by 40% during the crisis, compared to a pre-crisis period. We contrast financial and corporate governance considerations and find strong support for the notion that, during a crisis, financial constraints have a large impact on the restructuring choice. However, we find corporate governance (e.g., control) considerations to matter only marginally both in statistical and economic terms.

JEL codes: G33, G34.
Keywords: bankruptcy; liquidation, restructuring; corporate governance.

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## 1. Introduction

In presence of financial distress, a firm cannot typically meet its debt repayment obligations using its liquid assets. Unless there is a sudden recovery of performance, the distressed firm is likely to default on its debt. This could lead to a formal bankruptcy filing, a dismissal of the management, and possibly, liquidation of the firm (see, for example, Gilson, 1989). To avoid this, firms typically respond to financial distress by either restructuring assets (by fire sales, mergers, acquisitions and capital expenditures reductions) or liabilities (by restructuring debt --both bank loans and public debt-- and by injections of new capital from outside sources) or both.

Although firms face several restructuring options, most of the literature has focused on individual types of responses to distress (and their costs), primarily for US firms.[1] We could find only two exceptions. The first is a paper by Asquith, Gertner, and Scharfstein (1994), in which the authors provide a comprehensive analysis of several different forms of financial restructuring. They find that the structure of a company's liabilities is the most important determinant of the type of financial response to distress, while performance-related variables do not have any explanatory power. The focus of their paper is corporate responses under firm-specific financial distress as opposed to responses under economy-wide distress. Second, a recent paper by Atanassov and Kim (2006) looks at the determinants of asset sales, layoffs and managerial turnover as a response to firm specific distress, across a large number of countries. This study focuses primarily on regulatory variables, arguing that the form of restructuring chosen depends largely on the degree of investor protection (in a given country), as well as on labor laws.

[1] These studies include Brown, James and Mooradian's (1993) work on public debt and bank debt restructurings; Gilson (1990) on bank debt restructurings; Brown, James and Mooradian (1994) on asset sales; Erwin and McConnell (1997) on piecemeal voluntary liquidations; Tashjian, Lease and McConnell (1996) on prepackaged bankruptcies; and Ang, Chua and McConnell (1982), Franks and Torous (1989) and Hotchkiss (1994) on bankruptcy filings.

Despite the macroeconomic implications of an economy-wide financial crisis, there has been no comprehensive study, to the best of our knowledge, that looks into the specific ways in which firms try to avoid liquidation during such a downturn of economic activity, even for the US. This is an important distinction between our paper and other related work on corporate restructurings under financial distress.[2] In particular, we focus on the five countries ---Indonesia, Malaysia, the Philippines, South Korea and Thailand--- that were most affected by the Asian financial crisis of 1997-98. Among other things, this focus allows a direct investigation of Shleifer and Vishny's (1992) insight that, in industries facing a recession, external financing is scarce, and potential buyers (within the industry) cannot obtain external finance to purchase assets from firms under distress. Restructuring through asset sales might therefore become particularly unattractive because of large discounts on the value of the assets being sold.[3] Additionally, this study allows us to compile new evidence on the determinants of different types of responses to an economic (rather than a firm-specific) crisis.

A second important contribution of this study is to contrast two sets of determinants of the type of financial response: governance factors and capital structure/performance considerations. We specifically investigate the role of business groups and family ownership, which represent the prevalent form of corporate control outside the Anglo-Saxon systems. In the particular case of East Asia, most large firms are closely held conglomerates---structured as business groups---as opposed to widely held corporations in the US and the UK (La Porta, Lopez-de-Silanes and Shleifer, 1999; Claessens, Djankov and Lang, 2000). Given that the control of corporate assets were concentrated in the hands of a few wealthy families (organized as groups),

[2] In related work that is different from ours, Claessens, Djankov and Klapper (2003) analyze the likelihood of formal (as opposed to informal) bankruptcy filings during the Asian Crisis. They find that bankruptcy filings are less common for bank-owned and group affiliated firms.

[3] Pulvino (1998) documents that distressed U.S. airlines sell aircrafts at a 14 percent discount relative to their market value. This discount becomes even larger during market downturns.

it would be instructive to know as to whether group affiliation and ownership type had any role to play in the resolution of financial distress for these firms.[4,5]

An important consideration in the resolution of distress is negotiations between the distressed firm and its creditors. Banks can often be part of business groups. Such banks are known to give preferential access to capital for firms affiliated to the group, particularly for those in distress. This is partly because group-affiliation lessens capital market frictions.[6] This makes bank-led creditor workouts easier for group affiliated firms. Morck, Wolfenzon and Yeung (2005) argue that pyramid firms can also enjoy cheaper access to capital than free-standing firms even when banks are not part of the pyramidal group. This could be either because apex firms of the group can serve as banks or because superior bargaining power of such conglomerations reduces rent-seeking by outside banks.

Moreover, conglomerates often provide sufficient cross-guarantees to bail out troubled members within their group.[7] Group affiliation therefore dilutes the information that is available to an outside creditor. In a crisis situation, this opacity may help group-affiliated firms as there is a greater likelihood of being bailed out by creditors. Kim (2004) specifically argues that conglomeration is a device designed by firms to maximize the chance of bailout in the event of a default on their bank loans. His model demonstrates that a bank has more difficulty inferring the quality of members within a business group than that of stand alone firms. This is because inter-group loan guarantees prevent the bank from knowing whether the payment is from the borrower or from other firms in the group. Consequently, the bank is more likely to liquidate a freestanding

[4] Earlier work by Lang, Poulsen, and Stulz (1995) shows that, absent financial distress, entrenched US managers engage in sub-optimal divestiture decisions when this allows them to pursue their personal goals.
[5] Faccio, Masulis, and McConnell (2006) show that politically connected (typically family) firms are especially likely to receive a bailout from their home government during the crisis.
[6] The literature on relationship banking documents that asymmetric information problems make it difficult for a firm to initiate a lending relationship with a bank while hold-up problems make it difficult for firms to switch banks. Such problems are mitigated if both bank and firm are part of the same conglomeration.
[7] Friedman, Johnson and Mitton (2003) record instances where controlling shareholders often prop up distressed group firms (to the benefit of public shareholders) in order to attract external finance. While Hoshi, Kashyap and Scharfstein (1991) view such inter-firm transfers as enhancing economic efficiency by reducing bankruptcy costs, Morck and Nakamura (1999) present evidence showing that such transactions also include bailouts of inefficient firms.

firm than an otherwise identical group firm. This study provides an opportunity to find out whether this theoretical hypothesis holds true in practice.

With respect to capital structure considerations, it is known that debt has been the primary source of external finance in East Asia and that some corporations were highly leveraged. In a world where bankruptcy costs are not avoidable, characteristics of a firm's capital structure influence the likelihood of bankruptcy as well as the magnitude of the costs incurred (Senbet and Seward, 1995). An additional feature of Asian economies is that firms had incentives to delay debt, operational restructuring and even repayment of loans because of weak foreclosure and bankruptcy laws in the affected countries. Bankruptcy reforms were necessary not only to ensure actual firm failures but also for providing creditors and debtors to reach settlements out-of-court (see Claessens et al., 2001, for details).

Our results can be summarized as follows. Examination of 651 firms from 5 Asian countries hit by the financial crisis shows that firms predominantly respond to the crisis by restructuring their liabilities (18.3% of firms do so). The second-most important form of restructuring is asset sales (chosen by 12.3% of firms), which is followed by mergers (10.4% of firms). Liquidation is by far the least used option, with less of 4% of companies in the sample using this type of restructuring. We find support for Shleifer and Vishny's (1992) asset fire sale hypothesis by showing that company's reluctance to liquidate assets relates to extremely depressed prices across almost all industries during the crisis. In fact, asset sales that took place during the crisis on average occurred at a 40% price discount relative to sales of similar assets prior to the crisis.

As for the determinants of the type of response to the crisis, we find that firms' financial leverage is by far the most important determinant of workouts and asset sales, followed by market-to-book ratios and firm size. On the other hand, the degree of tangibility of assets (collateral) is important in explaining the likelihood that a firm merges or is taken over. While financial variables have a large impact on the type of response, we find that governance variables

matter little if at all. In fact, even when statistically significant, they have marginal economic impact on the choice of financial response. This gives little support to the theory of conglomeration advanced by Kim (2004). It also indicates that when facing a major economic crisis, controlling families concerns with maintaining control become less important, and are certainly dominated by the capability of firms to access additional capital.

The remainder is divided into six sections. In sections 2 we describe the data sources and variables employed. In section 3 we present descriptive statistics on the firms that opt for the different restructuring alternatives. Section 4 presents the regression results. In section 5 we provide a direct test of the asset fire sale hypothesis, and in section 6 we run a number of robustness tests. In section 7, we provide a conclusion and a brief summary.

## 2. Data sources and variables definition

*2.1. Corporate response to financial distress*

To identify the resolution of financial distress for each of the companies, we use the Asia Pacific News Archives of the *Troubled Company Reporter* (TCR). The TCR is a publicly available archive of news items on the website of the *Internet Bankruptcy Library* (IBL).[8] This database reports information related to financial distress for publicly traded companies worldwide. The database assembles information from regulatory filings, court pleadings, judicial rulings and press reports. The searches are run for each company over the period February 1, 1998 (the date TCR starts covering distress) to December 31, 2000. The responses are classified under the following four (financial) alternatives: (1) debt restructurings, (2) asset sales, (3) mergers and (4) liquidations.

We define debt restructuring (also referred to as a workout) as an agreement by the firms' creditors to modify any terms of an outstanding financial claim currently held against the firm. This term includes both public and private loan agreements. Common restructuring methods

[8] http://www.bankrupt.com/TCRAP_Public/index.html

include exchange offers (debt for equity), covenant modification and maturity extension or interest rate adjustments. The workout variable also includes injections of capital by creditors.[9] In fact, often, debt-restructurings were packaged to include a combination of rescheduling, debt-equity swaps and capital injections by creditors.

Asset sales are also used by firms to resolve financial distress. Brown et al. (1994) point out that asset sales for distressed firms occur primarily under the pressure of creditors, often to the detriment of stockholders.[10] In particular, they argue that the probability that an asset sale is used to repay debt increases with the firm's debt (leverage) and decreases with the firm's financial condition (operating performance).

Brown et al. (1994) also find that the distinguishing characteristics of firms which sell assets are that they operate multiple divisions and subsidiaries. As a result, diversified groups might be more likely to sell assets than free-standing firms. Moreover, managers that respond favorably to creditor pressure to undertake asset sales are more likely to retain control of the firm. This seems to suggest that firms in which owners have greater control rights at stake are more likely to undertake asset sales to retain control. Finally, as argued by Shleifer and Vishny (1992), illiquid asset markets may lead distressed firms to sell assets at significant discounts from their current value use. This consideration is particularly important for asset sales during an economy-wide crisis.

Our measure of asset sales comes from two sources: (1) items in the Troubled Company Reporter, and (2) data from *SDC Platinum* (which reports information on the divestitures of subsidiaries).[11] To check the robustness of our results, we use a dummy variable that takes the value of one if there is drop in the book value of property, plant and equipment (gross of accumulated depreciation and amortization) that exceeds 15% of the book value of total assets in

[9] Some authors, like Senbet and Seward (1995), have treated capital injections by creditors as a separate category.
[10] Lang, Poulsen, and Stulz (1995), however, find that asset sales used to retire debt result in a higher average (positive) abnormal stock return than when sales proceeds are retained by the firm.
[11] For our purposes, we only include divestitures resulting in a payment of US$10m or more.

any given year and zero otherwise. This dummy variable is generated using data from the *Worldscope* database for the period 1997-2000.

Next, we collect data on mergers and acquisitions starting with searches in the *Troubled Company Reporter* and then integrate this data with information from *SDC Platinum*, Worldwide Mergers and Acquisitions Database, and finally, keyword searches in *Factiva*. Lastly, the TCR archive was searched for liquidations of companies. This information was also integrated with keyword searches in *Factiva*. Examples of articles for each type of response to financial distress from the TCR archive (IBL web site) are reported in the Appendix.

*2.2 Governance variables*

To capture the influence of the largest shareholder, we control for the ultimate voting stake held by this agent. In general, shareholders who extract substantial control benefits have little incentive to undertake any form of restructuring that involves a sale of assets (especially those in its extreme form, such as liquidations) because this reduces their private benefits of control. Instead, these shareholders prefer debt workouts because this form of restructuring is unlikely to dilute their control. To control for this effect, we include the variable *Largest block-holder concentration* (also referred to as *Control*), which comes from Claessens, Djankov and Lang (2000), and captures the effects of complex control structures. For example, if a family owns 50% of Firm X that owns 30% of Firm Y, then this family is assumed to control 30% of Firm Y (the weakest link in the chain of control).

The same authors have assembled a number of data sources to identify whether a company is part of a major business *Group*. We use their business group variable to study the impact of conglomeration on the type of response to corporate distress. As mentioned before, Kim (2004) predicts a higher likelihood of a debt workout for a group affiliated firm.

Earlier work by Faccio, Masulis, and McConnell (2006) has shown that many Asian firms were owned by key politicians (or by people close to them) and frequently received

government aid during the crisis. Therefore, we control for whether a given company has outstanding political ties. As in their paper, a company is defined as *Politically connected* if at least one of its top directors (CEO, president, vice-president, or secretary) or large shareholders (any blockholder controlling at least 10% of votes) is a member of parliament, or a minister, or is closely related to a top politician or party. If these companies receive indirect aid from the government, we would not only expect a higher incidence of workouts, but also more frequent sales of assets (where buyers are pressured to purchase by government officials). At the very least, these firms are less likely to be liquidated in the event of distress since this would result in a loss of benefits for the politician.

We refine some of these variables further to distinguish between the types of controlling shareholders (e.g., families or governments) as well as to determine whether a company is part of a group that includes a bank. The latter would increase the likelihood of a workout because the company can presumably influence the bank's lending choices. In particular, we control for affiliation to a group that includes at least one bank by using the indicator variable *Bank in Group*. Information on the members of each business group is compiled based on data from Claessens et al. (2000). We also include two ownership indicators. The variable *Family* takes the value of one if the largest shareholder of the company under consideration is a family or a privately held firm and zero otherwise. Similarly, *Government* denotes instances in which the largest shareholder is a national government, a local authority, or a government agency.

### *2.3. Financial determinants of the response to distress*

In the rest of this section we will define the financial variables employed in the analysis. Unless stated differently, our main data source is the 1997 company financial reports of the *Worldscope* database.

Firstly, Brown et al. (1994) show that the most important predictors of bankruptcy filings are performance and leverage. To proxy for the company's accounting performance, we employ

the standard financial ratios like the *Return on Equity* (ROE) and the turnover of assets (ratio of *Sales/Total assets*). For robustness purposes, we also use the *Return on Assets* (ROA) and the *Industry Adjusted EBITDA/Assets* ratio. The latter is defined as the ratio of the company's earnings before interest expense, income taxes, depreciation and amortization (EBITDA), to the book value of its total assets. The ratio is netted out of its industry median (across all countries), where a firm's industry is given by its primary two-digit SIC code.

In addition, Asquith et al. (1994) also point out that a firm's capital structure is an important determinant of the type of financial response. For this reason, we include two proxies to capture high leverage. *Leverage* is the ratio of total debt to the sum of book value of equity plus book value of debt. The other proxy for leverage (and related financial distress) is *[(Interest Expense -- EBITDA)/ Interest Expense]*; computed as the ratio of the difference between interest expense on debt and EBITDA over the interest expense on debt. Interest expense on debt represents the service charge for the use of capital. EBITDA is defined as above.

We control for market expectations of recovery through the variable *Mkt. Value/ Book Ratio* (MB), computed as the ratio of the market value of equity (ordinary and preferred) plus book value of total debt over the book value of total assets. The latter is defined as the sum of total current assets, long term receivables, investment in unconsolidated subsidiaries, other investments, net property plant and equipment, and other assets.

Furthermore, the choice for a workout is likely to depend on company size and borrowing capability. In view of this, we also include the variables *Log(mkcapUS$)*, the log of the company's equity market capitalization as of December 31, 1997 measured in thousands of US$ and *Collateral*, calculated as the ratio of property, plant and equipment to total assets.

Finally, following Asquith et al. (1994), we initially test for the Shleifer and Vishny's (1992) idea that market for assets may be illiquid because potential industry buyers (who value assets most) are also distressed by adding the *Industry Median Leverage* and the *Industry Median MB Ratio* to our list of regressors. There variables are the median ratios of the *Leverage* and MB

variables (defined above) computed for firms (across all countries) in the same (two digit SIC) industry.

## 3. Summary Statistics

The countries included in this paper are the five countries that were most affected by the Asian Crisis of 1997-98. Firms in these countries were selected on the basis of three criteria. First, each firm must have financial data reported in the *Worldscope* database which is the primary source for accounting data. Second, each firm must be included in the ownership dataset complied by Claessens, Djankov and Lang (2000). Third, the primary business segment of each firm must not be in financial services, that is, not in the standard industrial classification (SIC) 6000-6999. The sample selection process is outlined in Panel A of Table 1. The final sample consists of 651 firms. In general, the sample is representative of larger firms that trade on the major stock exchanges in each country. As mentioned earlier, we identify the responses to the Asian financial crisis for each of these firms. The details of the responses and their distribution by country are provided in Table 1 and 2.

Several important trends are visible in the data. First, workouts seem to be the most preferred response to distress in East Asia. This gives some preliminary support to the arguments by Shleifer and Vishny (1992): given the large discounts that may need to be applied, forms of restructuring involving the sale of assets might become particularly unattractive. Such discounts clearly are not present when liabilities are being restructured.[12] Interestingly, many firms simply chose to do nothing: a natural response when creditors don't approve the restructuring of the firm's liabilities, and the discounts applied to asset fire sales are perceived to be too large.

When forms of restructuring involving the sale of assets (e.g., asset sales, mergers and liquidation) are considered together, they nonetheless add up to a considerable number of cases.

[12] On the contrary, restructurings often occurred with reducing the rates on the loans and even at times (rarely) with the creditor forgiving some part of the principal repayment due.

However, we need to point out that different form of asset sales cannot really be pooled together. For example, asset sales (as well as mergers) and liquidations are very different from a managerial perspective. Empirical studies for the US have shown that managers often sell assets to avoid bankruptcy since in Chapter 11 managerial turnover is high (Gilson, 1989; Hotchkiss 1994) and compensation is reduced (Gilson and Vetsuypens, 1993). Moreover, Brown, James and Mooradian (1994) show that managers are less likely to lose their jobs if they repay debt with proceeds from asset sales, since asset sales also reduce the probability of bankruptcy.[13]

Third, when compared to the other types of responses to the crisis, our sample records a small number of liquidations for the period 1998-2000. This supports the conjecture in White (2001) that bankruptcy procedures in countries affected by a systemic crisis are likely to result in very little liquidation. However, this could also be the case because, as mentioned earlier, our sample includes larger firms as opposed to smaller firms that face a higher probability of liquidation.

Panel B compares financial data by firms' response to the distress. Larger firms (size measured here by the mean of total assets) tend to restructure, while smaller firms are more likely not to undertake any visible form of restructuring. There is little difference between firms that undertake mergers or asset sales in terms of our summary statistics, except for the fact that firms that undergo mergers are on average smaller than those that resort to asset sales. On the other hand, the Panel B shows that firms that are liquidated have by far the worst net performance, with an average of ROE of -73.35%. The second-worst performance is found for companies that restructure their liabilities through a workout. Firms that don't restructure, on the other hand, tend to do relatively better: they are in fact the group with the highest average (and median) ROE and ROA. This result contrasts with Asquith et al. (1994) who, in the US, find no evidence that firms with better operating performance deal more successfully with financial distress. Panel B also

[13] It needs to be mentioned here that large East Asian firms are typically closely held, where the manager is often the largest shareholder. Therefore, it might be difficult to attribute some of the incentives that motivate US managers to operate for those in East Asian firms.

shows that companies under liquidation, or workout are very highly leveraged (the average *Leverage* is 85% for the workout group and 90% for the liquidations). Firms undertaking asset sales or mergers have lower, although still high, leverage. Once again, firms that do not restructure have relatively better financial conditions, with a leverage of only 61%. Firms that don't restructure also seem to have better MB ratios (at least when we look at average values).

An interesting observation here is that Panel B points to a different characteristic between the two responses: Among firms that have successfully dealt with the crisis, a larger fraction of them are affiliated to a business group. Furthermore, the voting stake held by the largest block-holder is significantly higher for firms undergoing a successful response to the crisis than those being forced to liquidate. In summary, firms that were successful in restructuring their debt or received injections of capital from outside are more likely to have better financial performance, be larger in size, affiliated to a group and closely held.

## 4. Regression results

In our regression analysis, we adopt two approaches to estimate for the determinants of responses. The first approach assumes that the responses of individual firms are independent, while the second relaxes this assumption. Note that, since multiple responses are possible for a single firm, we estimate a multivariate probit model in the second approach. This involves a general system of four equations (one for each response) with correlated disturbances, wherein the error terms are assumed to follow a multivariate normal distribution. We show below (Section 4.2) that even when we relax the assumptions of independent responses, the results are similar to that in the first approach. Therefore, in our case, using independent (univariate) probit equations for each response is not a restrictive assumption.

### *4.1 Independent Probit Regressions*

We will use probit equations to estimate the determinants of firm responses to financial distress. The results of probit equations under different specifications are reported in Tables 4-7. Before discussing the results it is important to point out that each specification includes three types of covariates, namely (i) financial variables, (ii) group affiliation data and (iii) industry performance variables. For operating performance, we use *Return on Equity* in specifications (1), (3) and (5), while *Sales/TA* is used in specifications (2), (4) and (6). For group affiliation data, specifications (1)-(2) use the *Group* dummy variable, specifications (3)-(4) use *Largest Block-holder Concentration* (or *Control*) and specifications (5)-(6) use other group affiliation variables like *Bank in Group*, *Family* and *Government*. For Tables 4-7, we report marginal effects computed at the means of the independent variables.

We find that four explanatory variables are significantly related to the probability of a workout: *Leverage*, *Mkt. Value/ Book Ratio*, *Log(mkcapUS$)*, and *Control*. *Leverage* is clearly the variable with the largest economic impact: one standard deviation increase in the firm's leverage ratio increases the likelihood of a workout by 0.54. The second most important variable is the *Mkt. Value/ Book Ratio*: One standard deviation increase in this variable reduces the likelihood of a workout by 0.19. The results also show that one standard deviation increase in size (*Log(mkcapUS$)*) increases the probability of restructuring through a workout by 0.09. Thus, companies that chose to restructure their liabilities are predominantly large firms with high leverage and poor growth prospects (as measured by the MB ratio). These results are consistent with the univariate evidence discussed earlier. However, the results strongly contrast with the evidence in Asquith et al. (1994) who only find the leverage ratio to be significant in their models. The variable *Control*, although statistically significant, has a marginal economic impact on the likelihood of a workout. In particular, one standard deviation increase in the percentage of control rights enjoyed by the largest shareholder increases the likelihood of a workout by 0.001. Finally, we find no statistical significance for *Collateral*, *Return on Equity*, industry variables and

other group-affiliation variables. Their economic impact is found to be small as well. Importantly, the results on the *Group* and *Family* dummies provide little support for Kim's (2004) arguments.

The variables that significantly explain the choice of selling assets (Table 5) are the same variables that were found to be significant in the case of debt-workouts (Table 4). As in the previous regression, the blockholder concentration variable, although statistically significant (this time with a negative sign), has a small impact on the likelihood of an asset sale. *Leverage* is once again the variable with the largest economic impact on the restructuring choice. In particular, we find that one standard deviation increase in leverage increases the likelihood of an asset sale by 0.37. Furthermore, a one-standard-deviation increase in the MB ratio decreases the likelihood of an asset sale by 0.15, while one standard deviation increase in size (as measured by *Log(mkcapUS$)* increases the likelihood of an asset sale by 0.13. Finally, firms owned by the government are likely to engage in asset sales. Government ownership increases the likelihood of asset sales by 0.09.

We then analyze the determinants of the decision to merge (or being taken over). Five variables explain this choice: *Leverage*, *Collateral*, the *Mkt. Value/ Book Ratio*, *[(Int. Expense – EBITDA)/Int. Expense]*, and *Control*. *Collateral* is positively and significantly related to the likelihood of a merger. One standard deviation increase in this variable results in an increase in the likelihood of a merger by 0.17. This result is in line with earlier evidence by Ambrose and Megginson (1992). The positive relationship may be explained by the fact that bidders like safe assets. Additionally, since firms with high collateral have higher debt capacity, they can be considered ideal target for high-leveraged transactions. Once again, *Leverage* is positively and significantly associated with the probability of restructuring --this time through a merger, although the impact of this variable is no longer as strongly statistically significant as for the previous two responses. One standard deviation increase in leverage increases the likelihood of a merger by 0.14. Notice that this result contrasts with most of the previous literature aimed at predicting takeover targets (e.g., Palepu, 1986, Song and Walkling, 1993, Comment and Schwert,

1995), which finds leverage to be insignificantly or negatively related to the likelihood of becoming a takeover target. The difference is however easily explained in this context: most highly leveraged firms in our sample are financially distressed, and therefore actively seek for some form of restructuring. We also find that firms with a low interest coverage ratio (high *(Int. Expense – EBITDA)/Int. Expense*) are more likely to be taken over, suggesting again a major need for a capital infusion. Fourth, we find that takeover targets tend to have poor growth perspectives, as proxied by their MB ratio.

We find a small but significant effect of control rights concentration on the likelihood of a merger: In particular, one standard deviation increase in the level of concentration of control results in a reduction of the likelihood of becoming a takeover target by 0.002. This result, too, is easily explained. If, as documented in Nenova (2003) and Dyck and Zingales (2004), control is valuable, a dominant shareholder may be reluctant to sell her stake since this would result in the loss of sizeable private benefits; the preference for other restructuring choices (or no restructuring at all) is then inevitable. Additionally, regressions (5) and (6) indicate that government-owned firms are more likely to experience a change in control. Similarly, takeovers are more likely to affect firms which belong to a group that includes a bank.

Finally, we examine the determinants of the choice of liquidation. Firms that opt for liquidation are small in size, highly leveraged, have more dispersed ownership and are less likely to have political connections. One standard deviation increase in leverage increases the likelihood of liquidation by anything from 0.02 to 0.06. Finally variables like *Control* and *Politically Connected* have a small, yet significant impact on the likelihood of liquidation. Not surprisingly, closely-held firms and those with political connections are less likely to be liquidated.

It is worthwhile to point out that the signs on the marginal effects for *Leverage* and MB ratio are the same in all of the four responses and across all specifications (for each response). This underlines the fact that highly leveraged firms with poor growth opportunities firms are simply more likely to react to the economic crisis through restructuring or face liquidation.

*4.2 Multivariate Probit Regressions*

An alternative way to estimate the model is to relax the assumption of independent responses. Consequently, the model can be estimated by a multivariate probit regression. This requires four probit equations (one for each response) with correlated disturbances, similar in spirit to seemingly unrelated regression models. The specification for the four-equation model is

$$y_{ij}^{*} = \mathbf{x}_{ij}\boldsymbol{\beta} + \varepsilon_{ij}, \quad i = 1,\ldots, n\,;\, j = 1,2,3,4.$$

$$y_{ij} = 1 \text{ if } y_{ij}^{*} > 0,\ 0 \text{ otherwise}$$

The error terms, $\varepsilon_{ij}$, are distributed as a multivariate normal, with a mean of zero, and a variance-covariance matrix $V$, in which $\text{cov}[\varepsilon_{ij}, \varepsilon_{ik}] = \rho_{jk} = \rho_{kj}$ and $\rho_{kk} = 1$.[14] The dependent variables in the model are

$y_{i1}$ = response is a debt workout

$y_{i2}$ = response is an asset sale

$y_{i3}$ = response is a merger

$y_{i4}$ = response is liquidation

Under the null that $\rho_{jk}$ =0 (for all $j \neq k$), the model consists of independent probit equations which could be estimated separately. This assumption was implicitly made by Asquith et al. (1994).

The estimated coefficients of the multivariate model are reported in Panel A of Table 8. Panel B of Table 8 reports the correlation structure of the error terms. Generally, the correlation coefficients are small. Note that the correlation coefficient between the error term in the first

[14] The practical difficulty to estimating the multivariate probit equation lies in evaluating higher-order mulitvariate normal integrals. The multidimensional normal integrals in the likelihood function are estimated using the GHK smooth recursive simulator described in Greene (2003, pp. 714-719).

equation and the error term in the second equation (i.e., $\rho_{12}$) and the correlation coefficient between the error term in the second and the error term in the fourth equation (i.e., $\rho_{24}$) are statistically significant. However, the other four correlation coefficients are not significant at standard levels. We then further investigate the lack of independence by computing the likelihood ratio of test for the null hypothesis $\rho_{12} = \rho_{13} = \rho_{14} = \rho_{23} = \rho_{24} = \rho_{34} = 0$ . The likelihood ratio test does not allow rejecting the null of zero correlation ( $\chi^2_{(6)}$ =8.39 and p-value=0.21). Thus, it seems that estimating independent probit regressions is not too restrictive an assumption.

We also report the coefficients for similar tests of the independent probit regressions in Table 9 (Note that Tables 4-7 report marginal effects). A quick comparison between the coefficients reported in Table 9 with those in Table 8, reveals a small difference between the two sets. The statistical significance of the coefficients is similar between the two estimations procedures.

## 5. Testing the "fire" sales hypothesis

Earlier work by Asquith et al. (1994) found that distressed companies are less likely to sell assets if they operate in highly leveraged industries, and more likely to sell assets if they operate in industries with higher growth perspectives. However, all companies are likely to face liquidity problems to some degree during an economy-wide crisis. This makes it difficult to find evidence in support of the above phenomenon if we limit our analysis to data during the crisis.

An alternative test of the fire-sale hypothesis would be to compare prices on asset sales before the onset of the crisis (which we will refer to as the pre-crisis period) to asset sales during, and in the aftermath of the crisis (also referred to as the post-crisis period). We compare the price-to-sales multiples paid for the acquisition of companies in a given (2-digit SIC) industry for the pre-crisis and post-crisis periods. We rely on the price to sales multiples for two reasons. First, multiples based on EBIT or accounting profits are rendered meaningless because most companies

had negative profitability during the crisis. Second, data on price-to-sales multiples is more readily available in *SDC Platinum* than other accounting items such as book value of equity. This is important because a larger sample size helps in reducing the impact of outliers in the data.

We first compute the ratio of the price paid for control transactions divided by the book value of sales for the given target. Control transactions include M&As, leveraged buyouts, inter-corporate tender offers, spin-offs, purchases of minority stakes (i.e., toehold acquisitions), of remaining interests, and recapitalizations. This is done for all recorded transactions in *SDC Platinum* between January 1, 1995 and December 31, 2000. To be included in our sample, the targets of these transactions must be headquartered in one of the five countries in our analysis. However, we do not impose any restriction on the country of the buyer.[15]

We then average the price-to-sales multiples across firms in each (2-digit SIC) industry, separately for the pre-crisis (1995-1997) and post-crisis (1998-2000) periods. Due to lack of observations (or possibly, a lack of transactions in the period of crisis) a comparison between data for the two periods is possible for only 30 industries (as before, we exclude the financial sector). The results are summarized in Table 10. In support of the fire-sale hypothesis we find that, for 23 out of 30 industries, the average multiple was lower in the post-crisis when compared to the pre-crisis period. More specifically, prior to the crisis, the average price to sales multiple (across all industries) was 4.18, while in the aftermath of the crisis this ratio dropped to 2.48. The difference between the two is statistically significant (paired t test p-value = 0.002). A comparison of the pre- and post-crisis periods indicates that prices dropped by 40.6% during the crisis, which suggests substantially large discounts. These discounts are more pronounced than those documented earlier by Pulvino (1998), who records an average discount of 14% for the sale of aircrafts by distressed airlines in the U.S., which further increased to 30% during market recessions. Larger discounts documented here can be explained when one considers two factors.

[15] It is worthwhile to point out that for 81% of the deals in the pre-crisis period, both target and bidder were from the same country. However, this proportion drops to 65% during the crisis. This is suggestive of the fact that fewer companies in countries affected by the crisis could bid successfully for a target.

First, as mentioned earlier, it is more difficult for corporations to sell assets during an economy-wide crisis because firms across all industries --as opposed to firms within the specific industry--- face liquidity problems. Second, these liquidity problems are more acute in emerging markets than in developed economies like the US. Clearly, these large discounts could explain why the restructuring of liabilities in our sample is more common than the sale of assets.

## 6. Robustness tests

*6.1 Media Bias*

Any study, for which empirical data has been collected from media reports, is bound to have a bias, and ours is no exception. For example, a large number of firms have been categorized under the do nothing group. Indeed, one could argue that such firms probably undertook some form of financial restructuring, but these were not captured in the news items of the IBL database. However, it is worthwhile to mention that firms classified under the do nothing group have better operating performance (e.g., higher MB ratios) and lower leverage than those belonging to any of the other groups. Clearly, such firms are more likely to do nothing when it comes to responding to the crisis.

*6.2 Distressed firms only*

Following Asquith et al. (1994), we conduct probit regressions over a sample of firms which are defined to be distressed under some financial criterion. A firm is defined to be financially distressed if during 1997-2000, the company had (any) two consecutive years with earnings before interest, taxes, depreciation and amortization (EBITDA) less than its reported interest expense or, in any one year, EBITDA was less than 80% of the firm's interest expense. This reduces the number of firms in the sample from 651 to 315.

The results of independent probit regressions on the (smaller) sample of distressed firms are presented in Table 11. The results confirm our findings from the full sample: the likelihood of undertaking an asset sale or a debt workout—the predominant forms of restructuring—increases with the leverage and size of the firm but decreases with better growth perspectives (as measured by the MB ratio). Moreover, just as in the full sample regression, *Collateral* is positively and significantly related to the likelihood of a merger. Again, we find a small but significant negative effect of control rights concentration on the likelihood of any asset-side restructuring (like a merger or an asset sale).

However, there are two notable exceptions when one includes distressed firms only. First, industry level variables now have a strong and significant impact on the likelihood of any asset-side restructuring. Both *Industry Median MB Ratio* and *Leverage* record positive and significant effects on the likelihood that a distressed firm undertakes an assets sale or a merger. Finally, some ownership variables are also significant for distressed firm restructurings, but their impact is small. In particular, *Family* ownership decreases the likelihood of asset sales, *Banks in Group* increases the likelihood of mergers and *Government* ownership increases the likelihood of liquidations.

*6.3 Other measures of asset sales*

As mentioned earlier, we check the robustness of our results on determinants of asset sales using a dummy variable of PPE reduction for drops in the book value of property, plant and equipment exceeding 15% of the book value of total assets in any given year.[16] As before, highly-leveraged firms are more likely to record drops in PPE, but now even the industry-wide leverage has a positive and significant impact on the likelihood of asset-side restructurings. Note that the sign on the variable contradicts the hypothesis that industry leverage adversely influences the likelihood of asset sales. A possible explanation here could be the distinction between an

[16] A copy of the robustness tests results is available from the authors upon request.

industry-wide recession and an economy-wide crisis. As a result of a crisis, firms selling assets under pressure from creditors may be forced to sell to buyers from a different industry or even (as documented earlier) to buyers in a different country. Thus, the likelihood of an asset sale increases with increase in the industry median leverage as creditors force companies to sell assets, to any buyer, even from outside the industry. Here too, the ownership variables have a small impact on asset sales.

*6.4 Other measures of operating performance*

As mentioned before, we conduct robustness checks on the determinants of a firms' choice of response by adopting different measures of operating performance. We conduct independent probit regressions by using two alternative measures, namely *Return on Assets* and *Industry Adjusted EBITDA/TA*. Again results confirm our findings from the full sample. A firm's financial condition is an important determinant of its restructuring choice while other ownership variables are marginally significant at best.

*6.5 Firm age, and other measures of growth opportunities.*

One concern with our previous results, in particular with respect to the MB ratio, is that it might be a proxy for things other than growth perspectives, for example the age of the firm. For this purpose we add a variable, *Age*, in our regressions.[17] The variable comes from Claessens et al. (2000) and identifies the year in which the company was established or incorporated. When adding this variable in our previous regressions, we find that younger firms are significantly more likely to sell assets or merge. The marginal effect of age is however small. Most importantly, none of our pervious findings (including the MB ratio results) change after controlling for age.

[17] These additional results, which are not reported in a specific table in the paper, are available from the authors upon request.

Finally, to address the concern that the MB ratio may still be problematic because its denominator (the book value of assets) of a firm's past investment choices, we alternatively employ the ratio of market capitalization to sales. We find that the market to sales ratio is also negatively correlated with the probability to sell assets, merge, or being liquidated. On the other hand, it is not significantly related to the likelihood that the company undertakes a workout.

## 7. Conclusion

This paper investigates the determinants of the choice of corporate restructuring during an economy-wide crisis. Evidently, financial variables have a large impact on the type of response, but we find that governance variables are only marginally significant at best. In particular, we find that companies which chose to restructure by asset sales and debt workouts are predominantly large firms with high leverage and poor growth prospects (as measured by the MB ratio). Companies with higher debt capacity (as measured by *Collateral*) are more likely targets of mergers. As for governance variables, we find, for example, that political connections can reduce the likelihood that a firm is liquidated. However, the impact of such variables is extremely small.

Another important finding of this study points to a preference of firms to undertake a restructuring of its liabilities as opposed to its assets during an economy-wide crisis. This is in line with previous theoretical hypothesis in Shleifer and Vishny (1992) that given a general downturn in the industry (in our case, the economy), asset sales might therefore become particularly unattractive because prospective buyers of such assets are themselves liquidity-constrained. This study documents evidence in support of the fire-sale hypothesis that, during the Asian crises, assets sales were usually made at large discounts (40% price discount on average).

## References


Ambrose, B. W., and W. L. Megginson (1992) "The role of asset structure, ownership structure, and takeover defenses in determining acquisition likelihood," Journal of Financial and Quantitative Analysis, 27, 575-590.

Ang, J.S., J.H. Chua, and J.J. McConnell (1982) "The administrative costs of corporate bankruptcy," Journal of Finance, 37, 219-226.

Asquith, P., G. Robert, and D. Scharfstein (1994) "Anatomy of financial distress: An examination of junk-bond issuers," Quarterly Journal of Economics, 109, 625-658.

Atanassov, J., and E. H. Kim (2006) "How do labor laws and investor protection affect corporate restructuring?," University of Michigan working paper.

Brown, D., C.M. James, and R. Mooradian (1993) "The information content of distressed restructurings involving public and private debt claims," Journal of Financial Economics, 33, 93-118.

Brown, D., C.M. James, and R. Mooradian (1994) "Asset sales by financially distressed firms," Journal of Corporate Finance, 1, 233-257.

Claessens, S., S. Djankov, and A. Mody (2001) "Resolution of Financial Distress: An International Perspective on the Design of Bankruptcy Laws," World Bank Institute Development Studies, Washington, D.C.

Claessens, S., S. Djankov, and L.H.P. Lang (2000) "The separation of ownership and control in East Asian corporations," Journal of Financial Economics, 58, 81-112.

Claessens, S., S. Djankov, and L. Klapper (2003) "Resolution of corporate distress in East Asia," Journal of Empirical Finance, 10, 199-216.

Comment, R., and G. W. Schwert (1995) "Poison or placebo? Evidence on the deterrence and wealth effects of modern anti-takeover measures," Journal of Financial Economics, 39, 3-43.

Dyck, A., and L. Zingales. (2004) "Private benefits of control: An international comparison," Journal of Finance, 59 , 537-600.

Erwin, G.R., and J. J. McConnell (1997) "To live or let die? An empirical analysis of piecemeal voluntary corporate liquidations," Journal of Corporate Finance, 3, 325-354.

Faccio, M., R. W. Masulis, and J. J. McConnell (2006) "Political connections and corporate bailouts," Journal of Finance, forthcoming.

Firedman, E., S. Johnson, and T. Mitton (2003) "Propping and tunneling," Journal of Comparative Economics, 31, 732-50.

Franks, J., and W. Torous (1989) “An empirical investigation of U.S. firms in reorganization,” Journal of Finance, 44, 747-769.

Gilson, S. (1989) “Management turnover and financial distress,” Journal of Financial Economics, 25, 241-262.

Gilson, S. (1990) “Bankruptcy, boards, banks, and blockholders” Evidence on changes in corporate ownership and control when firms default,” Journal of Financial Economics, 27, 355-387.

Gilson, S. and M.R. Vetsuypens, (1993) “CEO Compensation in Financially Distressed Firms: An Empirical Analysis,” Journal of Finance, 48, 425-458.

Greene, W. H. (2003) Econometric Analysis. Fifth Edition. Prentice Hall: Upper Saddle River, NJ.

Hoshi, T., A. Kashyap, and D. Scharfstein (1991) “Corporate structure, liquidity and investment: Evidence from Japanese industrial groups,” Quarterly Journal of Economics, 106, 33-60.

Hotchkiss, E. (1994) “Post-bankruptcy performance of management turnover,” Journal of Finance, 50, 321-345

Kim, S.-J. (2004) “Bailout and conglomeration,” Journal of Financial Economics, 71, 315-347.

La Porta, R., F. Lopez-de-Silanes, and A. Shleifer (1999) “Corporate ownership around the world,” Journal of Finance, 54, 471-517.

Lang, L., A. Poulsen and R. Stulz (1995) “Asset sales, firm performance, and the agency costs of managerial discretion,” Journal of Financial Economics, 37,3-37.

Morck, R., and M. Nakamura (1999) “Banks and Corporate Control in Japan,” Journal of Finance, Vol. 54: 319-339.

Morck R., D. Wolfenzon, B. Yeung (2005) “Corporate Governance, Economic Entrenchment, and Growth,” Journal of Economic Literature, Sept, forthcoming.

Nenova, T. (2003) “The value of corporate voting rights and control: A cross-country analysis,” Journal of Financial Economics, 68, 325-351.

Palepu, K.G. (1986) “Predicting takeover targets: A methodological and empirical analysis,” Journal of Accounting and Economics, 8, 3-35.

Pulvino, T. (1998) “Do Asset Fire-Sales Exist? An Empirical Investigation of Commercial Aircraft Transactions,” Journal of Finance, 53, 939-978.

Senbet, L., and J. Seward (1995) “Financial Distress, Bankruptcy and Reorganization,” in R Jarrow et al. (eds.), Handbook of Operations Research and Managerial Sciences, pp. 921-961.

Shleifer, A., and R. Vishny (1992) “Liquidation values and debt capacity: A market equilibrium approach,” Journal of Finance, 47, 1343-1366.

Song, M. H., and R. A. Walkling (1993) “The impact of managerial ownership on acquisition attempts and target shareholder wealth,” Journal of Financial and Quantitative Analysis, 28, 439-457.

Tashjian, E., R.C. Lease and J. J. McConnell (1996) “Prepacks: An empirical analysis of prepackaged bankruptcies,” Journal of Financial Economics, 40, 135-162.

White, M., (2001) “The Role of Bankruptcy Procedures in Countries Undergoing Financial Crises,” in Resolution of Financial D stress: An International Perspective on the Design of Bankruptcy Laws, edited by S. Claessens, S. Djankov, and A. Mody. Washington, D.C.: The World Bank WBI Development Studies.

**Appendix A: Examples of news articles from the Internet Bankruptcy Library's web site.**

*A.1 Examples of liquidations*

**ANAM ELECTRONICS: Applied for liquidation**
(TCR: Monday, March 22, 1999, Vol. 2, No. 56)

According to the Korean language Maeil Kyungje's Business Brief section, the Anam Electronics Company applied for liquidation.

Earlier newspaper reports mentioned that the Anam Electronics company's workout program was terminated on March 17th, 1999 when the main creditor of the electronics maker, Seoul Guarantee Insurance Company, refused to continue the company's workout program on the grounds of weak company performance.

**CHONGGU CORP: To Seek Court Receivership**
(TCR: Thursday, May 7, 1998, Vol. 1, No. 54)

A leading South Korean construction company, Chonggu Corp., which filed for court protection to reschedule its debts repayment, said Wednesday that it would instead seek court receivership within the week, sources at Chonggu and the Taegu District Court said. Under Korean bankruptcy law, a company loses managerial rights under court receivership and is liquidated. But under court protection, it can restructure, while retaining managerial control. The home-building firm would file for liquidation and court receivership Friday, on the recommendation of the court, the sources added. Chonggu's new direction comes on the heels of two big retailers, New Core and Midopa, being turned down for court protection for debt rescheduling by the courts. Judge Park Tae-ho of the Taegu court said that he had advised Chonggu Group chairman to file for liquidation because most of the conglomerate's affiliates had shown little sign of viability and had complicated debt problems. Three Chonggu affiliates, including the Bluehill Department Store, are likely to follow in the steps of its parent company. (Asia Pulse 06-May-1998)

**PT DHARMALA SAKTI SEJAHTERA: Court keeps bankruptcy status**
(TCR: Monday, August 7, 2000, Vol. 3, No. 152)

The Supreme Court has rejected PT Dharmala Sakti Sejahtera's appeal to revoke the company's bankruptcy status, according to court documents.

The Supreme Court said there were no legal defects to the original bankruptcy ruling issued by the Jakarta Commercial Court.

"The appeal cannot be sustained. We do not see that the Jakarta Commercial Court misapplying the bankruptcy law in its ruling against the company," the Supreme Court said.

Dharmala Sakti was declared bankrupt in early June after the majority of its creditors voted to reject the company's debt restructuring proposal. In its appeal the company claimed that the Jakarta Commercial Court had permitted a creditor vote "prematurely," and that two creditors acted in bad faith by influenced other creditors to vote against the debt restructuring proposal. Dharmala Sakti is now under court-supervised liquidation. (AFX News Limited 03- Aug-2000)

*A.2 Examples of asset sales*

LION GROUP: Finalizing restructuring scheme
**AMSTEEL CORP BHD**
(TCR: Tuesday, June 27, 2000, Vol. 3, No. 124)

The group's main problem appears to be Amsteel Corp Bhd, which has lots of other businesses, some unprofitable. Amsteel has incurred loans of nearly RM8.5bil which made up the bulk of the RM10.5bil in debts that the Lion group has. Major asset sales, expected to be spread over five years, would involve the potential divestment of: Shopping complexes such as the Subang Parade and Klang Parade in Selangor and the Mahkota Parade in Malacca; Asia Commercial Finance Bhd; A large stake in Malaysia British ssurance Bhd; and Klang-based Amsteel Securities Sdn Bhd.

One major transaction already completed has been the sale of a 50% stake in Inverfin Sdn Bhd, owner of Menara Lion, in a deal valued at RM200mil. Inverfin is 70% owned by Amsteel and the deal resulted in a net cash inflow of RM55.53mil. The group was supposed to have made an announcement on their restructuring in April but had to defer it because some issues had to be thrashed out with more than 100 creditors. (The Star Online 24-Jun-2000)

**SAN MIGUEL: Sells stake in drinks business**
(TCR: Thursday, July 16, 1998, Vol. 1, No. 102)

RP-Business News cites an Agence France-Presse article that Philippine food-and-beverage giant San Miguel Corp. has sold its 47-percent stake in a British soft drink bottling business spun off by Coca-Cola Amatil Ltd. (CCA) of Australia.

The sale in London fetched 339.6 million pounds (555 million dollars), it said.

San Miguel is the second largest shareholder of CCA with 25 percent, the result of a 2.7-billion-dollar stock swap agreement last year to create the largest Coca-Cola bottling group outside the United States.

The company invested more than 400 million dollars on a string of breweries and packaging plants in Hong Kong, China, Vietnam and Indonesia which went sour amid the Asian financial crisis.

**DAEWOO TELECOM: Sells off IT division**
(TCR: Thursday, October 12, 2000, Vol. 3, No. 199)

Daewoo Telecom announced Tuesday it signed a formal contract to sell off its IT operations to Mercury Telecom, a multinational holding firm.

Daewoo's IT operations will launch as Mercury Telecom beginning from November 1 as the special shareholders' meeting of the Korean firm, planned on October 25, is expected to endorse the deal. Daewoo Telecom precedes all 12 Daewoo business group subsidiaries undergoing workouts in the sell-off bid.

The selling price of the IT operations ranges from W330 billion to W370 billion, depending on performance this year and next, according to Daewoo Telecom. Mercury Telecom has been set up as a consortium, led by CVC, an investment arm of Citigroup of the United States. (Digital Chosun 10-Oct-2000)

**PT MEDCO ENERGI CORP.: Gets creditor approval of rehab**
(TCR: Monday, November 6, 2000, Vol. 3, No. 216)

PT Medco Energi Corp. (JSX:MEDC) said part of its debts would be converted into shares and the rest would be settled with a rollover of 8 years.

A company spokesman said the decision was made in a meeting last week attended by its creditors representing 92% of its total loan. The spokesman said the creditors gave commitment to support the restructuring program of the oil and gas contractor. In an earlier meeting, Medco succeeded in securing agreement from the majority of 52% of the creditors to restructure its US$ 250 million debts. (Asia Pulse 22-Oct-1999)

**REPUBLIC CEMENT CORP.: P6.5B loan deal with Blue Circle**
(TCR: Monday, August 28, 2000, Vol. 3, No. 167)

Republic Cement Corp. (RCC) will borrow P6.5 billion from Blue Circle Philippines Inc. (BCPI) for its capital expenditure requirements and debt servicing.

As of end-1999, RCC total borrowings were pegged at P2.433 billion. It ended the year with a net loss of P383.70 million. BCPI owns P495.8-million shares in RCC. The shares represent a 34-percent stake. It is a unit of London-based Blue Circle Industries Plc.

"The board of directors unanimously approved the availment by the corporation of a loan from BCPI up to the maximum principal amount of P6.5 billion and under such terms and conditions as may be agreed upon with BCPI. Part of the loan proceeds shall be used by the corporation to prepay its outstanding loans with various creditors," RCC senior vice president for finance Renato C. Sunico said in a disclosure to the Philippine Stock Exchange. (The Manila Times 26-Aug-2000)

**ACESITE HOTEL CORP.: Foreign firm in debt bailout**
(TCR: Friday, November 24, 2000, Vol. 3, No. 229)

A British Virgin Island company will bail out the owners of local hotel operator Acesite (Phils.) Hotel Corp. (APHC) from debts owed to a local bank through the acquisition of 75% stake in the listed firm's majority shareholder.

APHC president Francis Lam said the South Port Development Ltd. will acquire Acesite (BVI) Ltd. which owns majority interest in APHC, operator of the Holiday Inn Manila for 1.66 billion Philippine pesos ($33.50 million at PhP49.554=$1). The sale will avoid the foreclosure of shares in Acesite Limited and APHC by Equitable PCI Bank.

The said shares were used as collateral by Acesite Limited owners Evallon Investment Ltd. and Sino-i.com Ltd. to secure a $2-million loan from the local bank. South Port is currently engaged in the leisure business in the People's Republic of China and Australia.

Mr. Lam said the foreign firm is expected to bring new marketing and business opportunities to APHC. "This constitutes a positive contributing factor to the enhancement of the corporation's future operations and financial position," he said. (Business World 22-Nov-2000)

Table 1—Summary statistics: Panel A reports the summary statistics for 651 firms in five countries affected by the East Asian crisis. Panel B reports the summary statistics for the financial variables by the choice of firm response to the crisis. Summary statistics are means excepted where denoted. Financial statement data comes from Worldscope and is based on the latest financial statements prior to December 1997. The data for responses under distress have been collected publicly available archive of news items on the website of the Internet Bankruptcy Library (IBL), SCD and Factiva (see text for details). *Workout* is an agreement by the firms' creditors to modify any terms of an outstanding financial claim currently held against the firm (for both public and private loan agreements). *Asset Sale* includes news items that record both sales of assets and divestitures in subsidiaries or divisions in order to retire debt. *Merger* is an indicator that denotes whether a given company merged or was taken over during 1998-2000. *Liquidation* is an indicator that denotes whether a given company was liquidated during 1998-2000. Notice that a given company can undertake more than one form of restructuring at the same time. *Do nothing* indicate firms that did not undertake any visible form of financial restructuring during the period analyzed. *Mkt. capitalization ($, million)* is the company's equity market capitalization as of December 31, 1997 measured in millions of US$. *Total assets ($, million)* is the book value of the sum of total current assets, long term receivables, investment in unconsolidated subsidiaries, other investments, net property plant and equipment, and other assets. *Mkt. value/ book ratio* is the ratio of the market value of equity (ordinary and preferred) plus book value of total debt over the book value of total assets. The latter is defined as the sum of total current assets, long term receivables, investment in unconsolidated subsidiaries, other investments, net property plant and equipment, and other assets. *Leverage* is defined as the ratio of total debt to the sum of book value of equity plus book value of debt. *Return on Assets* (ROA) is calculated as annual earnings before interest and taxes (EBIT) divided by year-end total assets (%). *Return on Equity* (ROE) is calculated as net income available to shareholders divided by year-end book value of shareholder equity (%). *Largest block-holder concentration* is defined as the percentage holdings of the largest shareholder. *Group-affiliation* is a dummy variable that indicates whether the company is part of a major business group. This variable comes from Claessens, Djankov and Lang (2000).

Panel A: Comparison by country

| | All countries | Indonesia | Malaysia | Philippines | South Korea | Thailand |
|---|---|---|---|---|---|---|
| *Sample inclusion criteria* | | | | | | |
| Number of firms in Worldscope | 1,305 | 154 | 445 | 114 | 313 | 279 |
| Number of firms passing Claessens et al (2002) screen | 869 | 137 | 215 | 110 | 274 | 133 |
| Number of firms after the elimination of financial co.s | **651** | **104** | **159** | **70** | **225** | **93** |
| *Response under distress* | | | | | | |
| Workout | 119 | 20 | 17 | 10 | 43 | 29 |
| Asset sale | 80 | 3 | 26 | 8 | 34 | 9 |
| Merger | 68 | 4 | 15 | 12 | 32 | 5 |
| Liquidation | 26 | 2 | 0 | 0 | 23 | 1 |
| *Financial Statistics* | | | | | | |
| Mkt. capitalization ($, million) | 258.36 | 286.08 | 507.62 | 231.46 | 135.06 | 119.72 |
| Total assets ($, million) | 853.72 | 497.21 | 718.88 | 422.05 | 1,425.33 | 424.87 |
| Mkt. Value/ Book Ratio (mean) | 1.19 | 1.08 | 1.51 | 0.97 | 1.11 | 1.10 |
| Mkt. Value/ Book Ratio (median) | 1.02 | 0.89 | 1.05 | 0.82 | 1.07 | 0.97 |
| Leverage | 0.68 | 0.66 | 0.56 | 0.47 | 0.82 | 0.73 |
| Return on assets | 0.71 | 1.46 | 4.64 | 3.59 | 1.49 | -10.88 |
| Return on equity | -16.05 | -9.43 | 0.37 | 2.61 | -24.61 | -44.89 |
| *Ownership Structure* | | | | | | |
| Group affiliation (percentage) | 59.45 | 69.23 | 59.12 | 74.29 | 54.22 | 50.54 |
| Largest block-holder concentration | 26.09 | 34.76 | 28.36 | 24.21 | 17.77 | 34.02 |

Panel B: Comparison by response type

| Response | No. of firms | Total Assets | Mkt. Value/ Book Ratio | | Leverage | | Return on assets | | Return on equity | | Largest block-holder concentration | | Group affiliation |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Mean | Mean | Median | Mean | Median | Mean | Median | Mean | Median | Mean | Median | Percentage |
| Workout | 119 | 1,535.71 | 1.11 | 1.02 | 0.85 | 0.84 | -6.02 | -0.37 | -42.85 | -15.25 | 25.16 | 29.85 | 67.23 |
| Asset sale | 80 | 2,708.42 | 1.07 | 1.07 | 0.78 | 0.82 | -0.44 | 3.41 | -14.82 | -1.55 | 20.92 | 20.00 | 66.25 |
| Merger | 68 | 1,182.50 | 1.11 | 1.06 | 0.77 | 0.83 | -0.39 | 2.08 | -19.68 | -7.96 | 22.42 | 20.00 | 64.70 |
| Liquidation | 26 | 1,864.42 | 1.07 | 1.03 | 0.90 | 0.94 | -1.14 | 0.18 | -73.35 | -41.68 | 15.57 | 10.00 | 50.00 |
| Do nothing | 423 | 474.15 | 1.24 | 1.00 | 0.61 | 0.61 | 2.74 | 4.31 | -6.87 | 4.07 | 27.50 | 30.00 | 57.21 |

Table 2—Classification of responses by firms. The responses are recorded under the following four (financial) alternatives available to corporate managers for dealing with distress: (1) financial (or debt) restructurings, (2) asset sales, (3) mergers and (4) liquidations. *Workout* is an agreement by the firms' creditors to modify any terms of an outstanding financial claim currently held against the firm (for both public and private loan agreements). *Asset Sale* includes news items that record both sales of assets and divestitures in subsidiaries or divisions in order to retire debt. *Merger* is an indicator that denotes whether a given company merged or was taken over during 1998-2000. *Liquidation* is an indicator that denotes whether a given company was liquidated during 1998-2000. The data sources for all variables are given in the text. In Panel A, the diagonal numbers denote single responses by firms, while off-diagonal numbers denote two responses by firms. Panel B lists the distribution of responses for firms that record three responses. No firm in our sample has recorded four responses.

Panel A: One or two responses by firms

| | Workout | Asset sale | Merger | Liquidation |
|---|---|---|---|---|
| Workout | 74 | | | |
| Asset sale | 23 | 40 | | |
| Merger | 13 | 12 | 36 | |
| Liquidation | 2 | 0 | 1 | 20 |
| Total | 119 | 80 | 68 | 26 |

Panel B: Three responses by firms

| Response | (1) | (2) | (3) | (4) | (5) | (6) | (7) | Total |
|---|---|---|---|---|---|---|---|---|
| Workout | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 7 |
| Asset sale | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 5 |
| Merger | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 6 |
| Liquidation | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 3 |

Table 3—Pair-wise correlations for exogenous variables. *Leverage* is defined as the ratio of total debt to the sum of book value of equity plus book value of debt. *[(Interest Expense – EBITDA)/ Interest Expense]* is computed as the ratio of the difference between interest expense on debt and EBITDA over the interest expense on debt. Interest expense on debt represents the service charge for the use of capital. EBITDA is defined as earnings of a company before interest expense, income taxes, depreciation and amortization. *Mkt. value/ book ratio* is the ratio of the market value of equity (ordinary and preferred) plus book value of total debt over the book value of total assets. The latter is defined as the sum of total current assets, long term receivables, investment in unconsolidated subsidiaries, other investments, net property plant and equipment, and other assets. *Collateral* is calculated as the ratio of property, plant and equipment to total assets. *Log (mkcapUS$)* is the log of the company's equity market capitalization as of December 31, 1997 measured in thousands of US$. *Return on Equity* (ROE) is calculated as net income available to shareholders divided by year-end book value of shareholder equity (%). *Sales/TA*, also the asset-turnover ratio, is measured as the total sales divided by total assets. *Group* is a dummy variable that indicates whether the company is part of a major business group. This variable comes from Claessens, Djankov and Lang (2000). *Largest block-holder concentration* is defined as the percentage holdings of the largest shareholder. *Industry Median MB Ratio* and *Industry Median Leverage* are industry-level financial variables where a firm's industry is defined based on its primary two-digit SIC code (across countries). *Political connection* is a dummy variable that takes the value of 1 if at least one of the company's top directors (CEO, president, vice-president, or secretary) or large shareholders (any blockholder controlling at least 10% of votes) is a member of parliament, or a minister, or is closely related to a top politician or party, and 0 otherwise.

| | Leverage | [(Int. Expense – EBITDA)/ Int. Expense] | Mkt. Value/ Book Ratio | Collateral | Log (Mkt. Cap) (US$) | Return on Equity | Sales/ TA | Group | Largest block-holder concen. | Industry Median MB Ratio | Industry Median Leverage |
|---|---|---|---|---|---|---|---|---|---|---|---|
| [(Int. Expense – EBITDA)/ Int. Expense] | 0.029 | | | | | | | | | | |
| Mkt. Value/ Book Ratio | 0.124 | -0.161 | | | | | | | | | |
| Collateral | -0.044 | -0.060 | -0.079 | | | | | | | | |
| Log (Mkt. Cap) in USD | -0.178 | -0.063 | 0.339 | 0.127 | | | | | | | |
| Return on Equity | -0.506 | -0.047 | 0.006 | -0.041 | 0.219 | | | | | | |
| Sales/TA | 0.073 | -0.073 | 0.141 | -0.231 | -0.037 | 0.050 | | | | | |
| Group | -0.006 | 0.021 | -0.018 | -0.071 | 0.119 | 0.058 | 0.025 | | | | |
| Largest block-holder concentration | -0.131 | -0.028 | 0.104 | 0.072 | 0.121 | 0.027 | 0.069 | 0.071 | | | |
| Industry Median MB Ratio | -0.014 | -0.082 | 0.364 | -0.105 | 0.238 | 0.072 | 0.116 | 0.081 | 0.108 | | |
| Industry Median Leverage | 0.284 | -0.117 | -0.102 | -0.130 | -0.116 | -0.077 | 0.149 | -0.001 | -0.065 | -0.058 | |
| Politically connected | -0.018 | -0.020 | 0.103 | -0.076 | 0.207 | 0.033 | -0.073 | 0.127 | 0.080 | 0.126 | -0.086 |

Table 4—Determinants of Workouts: Results of independent probit regressions used to predict firm debt workouts. Dependent variable is an indicator equal to 1 if a company undertook a debt workout during 1998-2000, and zero otherwise. Workout is an agreement by the firms' creditors to modify any terms of an outstanding financial claim currently held against the firm (for both public and private loan agreements). *Family* takes the value of one if the largest shareholder of the company under consideration is a family or a privately held firm. *Government* denotes instances in which the largest shareholder is a national government, a local authority, or a government agency. *Bank in Group* takes the value of one if the group includes at least one bank. The definitions of the other regressors are the same as in Table3. Robust standard errors, corrected for country-level clustering, are reported in parentheses below the marginal effects; ***, **, * indicate significance at 1-, 5- and 10-percent levels, respectively.

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| Leverage | 0.538*** | 0.445*** | 0.562*** | 0.456*** | 0.534*** | 0.442*** |
| | (0.056) | (0.128) | (0.059) | (0.145) | (0.046) | (0.121) |
| [(Int. Expense – EBITDA) / Int. Expense] | -0.0000236 | -0.000036 | -0.0000219 | -0.0000349 | -0.0000229 | -0.0000357 |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| Mkt. Value/ Book Ratio | -0.185*** | -0.142*** | -0.195*** | -0.149*** | -0.186*** | -0.144*** |
| | (0.023) | (0.049) | (0.024) | (0.055) | (0.024) | (0.047) |
| Collateral | 0.007 | -0.034 | -0.011 | -0.053 | -0.000451 | -0.047 |
| | (0.083) | (0.086) | (0.082) | (0.085) | (0.092) | (0.095) |
| Log (Mkt. capital) in USD | 0.090*** | 0.078* | 0.096*** | 0.083* | 0.094*** | 0.083* |
| | (0.033) | (0.044) | (0.036) | (0.048) | (0.035) | (0.046) |
| Return on Equity | -0.0000796 | | -0.0000359 | | -0.0000667 | |
| | (0.000) | | (0.000) | | (0.000) | |
| Sales/TA | | -0.116** | | -0.114** | | -0.115** |
| | | (0.057) | | (0.054) | | (0.057) |
| Group | 0.039 | 0.045 | | | | |
| | (0.032) | (0.036) | | | | |
| Largest block-holder concentration | | | 0.001** | 0.001 | | |
| | | | (0.001) | (0.001) | | |
| Bank in Group | | | | | -0.021 | -0.013 |
| | | | | | (0.055) | (0.057) |
| Family | | | | | 0.007 | 0.004 |
| | | | | | (0.036) | (0.034) |
| Government | | | | | -0.002 | -0.016 |
| | | | | | (0.054) | (0.048) |
| Politically connected | 0.061 | 0.036 | 0.061 | 0.039 | 0.066 | 0.042 |
| | (0.066) | (0.058) | (0.057) | (0.049) | (0.059) | (0.052) |
| Industry Median MB Ratio | -0.139 | -0.108 | -0.121 | -0.093 | -0.131 | -0.098 |
| | (0.103) | (0.081) | (0.105) | (0.080) | (0.111) | (0.085) |
| Industry Median Leverage | -0.142* | -0.028 | -0.143* | -0.024 | -0.136 | -0.022 |
| | (0.086) | (0.131) | (0.080) | (0.126) | (0.086) | (0.122) |
| Observations | 549 | 560 | 549 | 560 | 549 | 560 |
| Pseudo R-squared | 0.13 | 0.12 | 0.12 | 0.12 | 0.12 | 0.12 |

Table 5—Determinants of Asset Sales: Results of independent probit regressions used to predict firm asset sales. Dependent variable is an indicator equal to 1 if a company undertook an asset sale during 1998-2000, and zero otherwise. Asset Sale includes news items that record both sales of assets and divestitures in subsidiaries or divisions in order to retire debt. Data on asset sales comes from two sources: (1) we look at whether any information concerning sales of assets was reported in the *Troubled Company Reporter*, and (2) we integrate this data with the information contained in *SDC Platinum*™, which reports information on the divestitures of subsidiaries. The definitions of the regressors are the same as in Tables 3 and 4. Robust standard errors, corrected for country-level clustering, are reported in parentheses below the marginal effects; ***, **, * indicate significance at 1-, 5- and 10-percent levels, respectively.

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| Leverage | 0.374*** | 0.300*** | 0.319*** | 0.262*** | 0.374*** | 0.302*** |
| | (0.054) | (0.054) | (0.053) | (0.055) | (0.052) | (0.046) |
| [(Int. Expense – EBITDA) / Int. Expense] | -0.000003 | -0.000005 | -0.000004 | -0.000004 | 0.000001 | -0.000003 |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| Mkt. Value/ Book Ratio | -0.156*** | -0.168*** | -0.143*** | -0.155*** | -0.156*** | -0.167*** |
| | (0.046) | (0.043) | (0.044) | (0.042) | (0.045) | (0.042) |
| Collateral | -0.086 | -0.080 | -0.068 | -0.058 | -0.068 | -0.066 |
| | (0.053) | (0.059) | (0.048) | (0.059) | (0.052) | (0.055) |
| Log (Mkt. capital) in USD | 0.132*** | 0.137*** | 0.129*** | 0.132*** | 0.126*** | 0.130*** |
| | (0.031) | (0.027) | (0.030) | (0.026) | (0.025) | (0.022) |
| Return on Equity | 0.0002908 | | 0.0001989 | | 0.0002747* | |
| | (0.000) | | (0.000) | | (0.000) | |
| Sales/TA | | 0.009 | | 0.010 | | 0.005 |
| | | (0.012) | | (0.014) | | (0.012) |
| Group | -0.007 | -0.006 | | | | |
| | (0.072) | (0.070) | | | | |
| Largest block-holder concentration | | | -0.003*** | -0.003*** | | |
| | | | (0.001) | (0.001) | | |
| Bank in Group | | | | | -0.002 | -0.002 |
| | | | | | (0.044) | (0.043) |
| Family | | | | | -0.005 | -0.004 |
| | | | | | (0.039) | (0.039) |
| Government | | | | | 0.096** | 0.085** |
| | | | | | (0.039) | (0.037) |
| Politically connected | 0.026 | 0.025 | 0.033 | 0.034 | 0.032 | 0.030 |
| | (0.045) | (0.042) | (0.044) | (0.041) | (0.040) | (0.038) |
| Industry Median MB Ratio | -0.034 | -0.019 | -0.022 | -0.009 | -0.033 | -0.015 |
| | (0.034) | (0.032) | (0.047) | (0.045) | (0.039) | (0.033) |
| Industry Median Leverage | -0.044 | -0.012 | -0.026 | -0.003 | -0.043 | -0.006 |
| | (0.137) | (0.124) | (0.125) | (0.112) | (0.129) | (0.114) |
| Observations | 549 | 560 | 549 | 560 | 549 | 560 |
| Pseudo R-squared | 0.17 | 0.16 | 0.18 | 0.18 | 0.18 | 0.17 |

Table 6—Determinants of Mergers: Results of independent probit regressions used to predict merger of firms. Dependent variable is an indicator equal to 1 if a company was taken over or undertook a merger with another firm during 1998-2000, and zero otherwise. The definitions of the regressors are the same as in Tables 3 and 4. Robust standard errors, corrected for country-level clustering, are reported in parentheses below the marginal effects; ***, **, * indicate significance at 1-, 5- and 10-percent levels, respectively.

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| Leverage | 0.174* | 0.143* | 0.142* | 0.118 | 0.182** | 0.150* |
| | (0.090) | (0.081) | (0.082) | (0.073) | (0.089) | (0.084) |
| [(Int. Expense – EBITDA) /Int. Expense] | 0.000023*** | 0.000019** | 0.000023** | 0.000019** | 0.000023*** | 0.000019*** |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| Mkt. Value/ Book Ratio | -0.055*** | -0.060*** | -0.049*** | -0.054*** | -0.058*** | -0.063*** |
| | (0.010) | (0.010) | (0.007) | (0.008) | (0.008) | (0.009) |
| Collateral | 0.173*** | 0.161** | 0.181*** | 0.173** | 0.167** | 0.153** |
| | (0.066) | (0.069) | (0.067) | (0.069) | (0.065) | (0.070) |
| Log (Mkt. capital) in USD | 0.022 | 0.026 | 0.022 | 0.026 | 0.023 | 0.027 |
| | (0.026) | (0.027) | (0.025) | (0.025) | (0.030) | (0.031) |
| Return on Equity | 0.0001658 | | 0.0001315 | | 0.0001855** | |
| | (0.000) | | (0.000) | | (0.000) | |
| Sales/TA | | -0.007 | | -0.003 | | -0.006 |
| | | (0.008) | | (0.009) | | (0.008) |
| Group | 0.021 | 0.024 | | | | |
| | (0.022) | (0.020) | | | | |
| Largest block-holder concentration | | | -0.002*** | -0.002*** | | |
| | | | (0.000) | (0.000) | | |
| Bank in Group | | | | | 0.026 | 0.029** |
| | | | | | (0.017) | (0.015) |
| Family | | | | | -0.006 | -0.008 |
| | | | | | (0.034) | (0.033) |
| Government | | | | | 0.055* | 0.049* |
| | | | | | (0.031) | (0.028) |
| Politically connected | 0.008 | 0.003 | 0.022 | 0.019 | 0.014 | 0.011 |
| | (0.022) | (0.024) | (0.023) | (0.025) | (0.026) | (0.030) |
| Industry Median MB Ratio | 0.044 | 0.050 | 0.057 | 0.062 | 0.054 | 0.061 |
| | (0.058) | (0.064) | (0.054) | (0.060) | (0.063) | (0.068) |
| Industry Median Leverage | 0.192 | 0.207 | 0.195 | 0.202 | 0.185 | 0.199 |
| | (0.160) | (0.148) | (0.157) | (0.146) | (0.163) | (0.153) |
| Observations | 549 | 560 | 549 | 560 | 549 | 560 |
| Pseudo R-squared | 0.06 | 0.06 | 0.07 | 0.07 | 0.06 | 0.06 |

Table 7—Determinants of Liquidations: Results of independent probit regressions used to predict liquidations of firms. Dependent variable is an indicator equal to 1 if a company was liquidated during 1998-2000, and zero otherwise. The definitions of the regressors are the same as in Tables 3 and 4. Robust standard errors, corrected for country-level clustering, are reported in parentheses below the marginal effects; ***, **, * indicate significance at 1-, 5- and 10-percent levels, respectively.

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| Leverage | 0.064** | 0.059 | 0.023** | 0.025 | 0.060* | 0.056 |
| | (0.032) | (0.039) | (0.012) | (0.018) | (0.033) | (0.039) |
| [(Int. Expense – EBITDA) /Int. Expense] | -0.0000621 | -0.0000421 | -.0000282 | -0.000022 | -0.0000464 | -0.0000263 |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| Mkt. Value/ Book Ratio | -0.030 | -0.033 | -0.016* | -0.017 | -0.028 | -0.032 |
| | (0.022) | (0.021) | (0.008) | (0.010) | (0.021) | (0.021) |
| Collateral | -0.057 | -0.053 | -0.021 | -0.020 | -0.055 | -0.052 |
| | (0.040) | (0.041) | (0.015) | (0.018) | (0.042) | (0.044) |
| Log (Mkt. capital) in USD | -0.004** | -0.003*** | -0.003*** | -0.002*** | -0.004*** | -0.004*** |
| | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) |
| Return on Equity | -0.0000126 | | -0.0000139 | | -0.0000129 | |
| | (0.000) | | (0.000) | | (0.000) | |
| Sales/TA | | -0.003 | | -0.001 | | -0.003 |
| | | (0.008) | | (0.003) | | (0.007) |
| Group | -0.007 | -0.007 | | | | |
| | (0.006) | (0.006) | | | | |
| Largest block-holder concentration | | | -0.001* | -0.001* | | |
| | | | (0.000) | (0.000) | | |
| Bank in Group | | | | | 0.001 | 0.002 |
| | | | | | (0.005) | (0.004) |
| Family | | | | | 0.005 | 0.007 |
| | | | | | (0.005) | (0.006) |
| Government | | | | | 0.016* | 0.016 |
| | | | | | (0.008) | (0.010) |
| Politically connected | -0.009*** | -0.009** | -0.003* | -0.003 | -0.010** | -0.010** |
| | (0.003) | (0.004) | (0.002) | (0.002) | (0.004) | (0.005) |
| Industry Median MB Ratio | -0.002 | 0.007 | -0.002 | 0.001 | -0.008 | 0.003 |
| | (0.014) | (0.006) | (0.010) | (0.007) | (0.020) | (0.010) |
| Industry Median Leverage | -0.049 | -0.039 | -0.021 | -0.021 | -0.050 | -0.041 |
| | (0.037) | (0.037) | (0.015) | (0.019) | (0.041) | (0.042) |
| Observations | 549 | 560 | 549 | 560 | 549 | 560 |
| Pseudo R-squared | 0.20 | 0.19 | 0.28 | 0.26 | 0.20 | 0.19 |

Table 8—Multivariate probit regressions: The sample includes 559 companies with available data. The dependent variable is a vector of responses, where each element of the vector is an indicator variable of responses that takes the value 1 if the firms selects that response in distress. The four responses are as follows: (1) *Workout* is an agreement by the firms' creditors to modify any terms of an outstanding financial claim currently held against the firm (for both public and private loan agreements); (2) *Asset Sale* includes news items that record both sales of assets and divestitures in subsidiaries or divisions in order to retire debt; (3) *Merger* is an indicator that denotes whether a given company merged or was taken over during 1998-2000; (4) *Liquidation* is an indicator that denotes whether a given company was liquidated during 1998-2000. The definitions of the regressors are the same as in Tables 3 and 4. Robust standard errors, corrected for country-level clustering, are reported in parentheses below the coefficients; ***, **, * indicate significance at 1-, 5- and 10-percent levels, respectively.

Panel A. Coefficient Estimates of Multivariate Probit equations

| | Workout | Asset Sale | Mergers | Liquidation |
|---|---|---|---|---|
| Leverage | 1.859*** | 1.763*** | 0.850* | 2.304*** |
| | (0.519) | (0.333) | (0.488) | (0.830) |
| [(Int. Expense – EBITDA) /Int. Expense] | -0.000* | -0.000 | 0.000* | -0.001 |
| | (0.000) | (0.000) | (0.000) | (0.001) |
| Mkt. Value/ Book Ratio | -0.592*** | -0.972*** | -0.347*** | -1.439** |
| | (0.215) | (0.158) | (0.070) | (0.716) |
| Collateral | -0.145 | -0.442 | 0.967** | -1.993*** |
| | (0.358) | (0.331) | (0.429) | (0.693) |
| Log (Mkt. capital) in USD | 0.324 | 0.814*** | 0.148 | -0.102 |
| | (0.210) | (0.080) | (0.166) | (0.096) |
| Sales/TA | -0.504*** | 0.053 | -0.055 | -0.087 |
| | (0.183) | (0.083) | (0.049) | (0.262) |
| Bank in Group | 0.196 | -0.033 | 0.142 | -0.239** |
| | (0.176) | (0.409) | (0.128) | (0.114) |
| Politically connected | 0.144 | 0.134 | 0.023 | -0.491*** |
| | (0.214) | (0.203) | (0.144) | (0.105) |
| Industry Median MB Ratio | -0.447 | -0.115 | 0.301 | 0.260 |
| | (0.316) | (0.187) | (0.370) | (0.323) |
| Industry Median Leverage | -0.153 | -0.139 | 1.215 | -1.484* |
| | (0.534) | (0.756) | (0.916) | (0.890) |
| Constant | -2.299* | -4.860*** | -3.819*** | 0.071 |
| | (1.276) | (0.925) | (0.947) | (1.282) |
| Number of Observations | | | | 560 |
| Log pseudo-likelihood | | | | -684.52 |

Panel B. Estimates of the covariance terms of multivariate probit equation

| | (1) | (2) | (3) |
|---|---|---|---|
| (2) | 0.174** | | |
| | (0.082) | | |
| (3) | 0.132 | 0.168 | |
| | (0.103) | (0.107) | |
| (4) | -0.108 | -0.228*** | 0.020 |
| | (0.128) | (0.084) | (0.103) |

Likelihood ratio test of $\rho_{12} = \rho_{13} = \rho_{14} = \rho_{23} = \rho_{24} = \rho_{34} = 0$:

$\chi^2_{(6)} = 8.39$ Prob > $\chi^2$ = 0.21

Table 9—Independent Probit regressions: The sample includes 559 companies with available data. In regression (1), the dependent variable is an indicator equal to 1 if a company opted for a workout of liabilities, and zero otherwise. In regression (2), the dependent variable is an indicator equal to 1 if a company undertook an asset sale, and zero otherwise. In regression (3), the dependent variable is an indicator equal to 1 if a company merged with another, and zero otherwise. In regression (4), the dependent variable is an indicator equal to 1 if a company was liquidated, and zero otherwise. The definitions of the regressors are the same as in Tables 3 and 4. Robust standard errors, corrected for country-level clustering, are reported in parentheses below the coefficients; ***, **, * indicate significance at 1-, 5- and 10-percent levels, respectively.

| | (1) Workout | (2) Asset Sale | (3) Mergers | (4) Liquidation |
|---|---|---|---|---|
| Leverage | 1.865*** | 1.789*** | 0.856* | 2.247*** |
| | (0.528) | (0.355) | (0.475) | (0.717) |
| [(Int. Expense – EBITDA) /Int. Expense] | -0.000* | -0.000 | 0.000* | -0.002 |
| | (0.000) | (0.000) | (0.000) | (0.001) |
| Mkt. Value/ Book Ratio | -0.597*** | -0.998*** | -0.359*** | -1.282** |
| | (0.215) | (0.165) | (0.073) | (0.623) |
| Collateral | -0.145 | -0.475 | 0.961** | -2.021*** |
| | (0.352) | (0.313) | (0.427) | (0.694) |
| Log (Mkt. capital) in USD | 0.327 | 0.813*** | 0.154 | -0.127 |
| | (0.214) | (0.082) | (0.163) | (0.082) |
| Sales/TA | -0.485** | 0.055 | -0.043 | -0.097 |
| | (0.198) | (0.077) | (0.042) | (0.267) |
| Bank in Group | 0.191 | -0.035 | 0.149 | -0.262*** |
| | (0.177) | (0.409) | (0.123) | (0.097) |
| Politically connected | 0.142 | 0.140 | 0.019 | -0.496*** |
| | (0.212) | (0.202) | (0.145) | (0.106) |
| Industry Median MB Ratio | -0.455 | -0.111 | 0.301 | 0.278 |
| | (0.324) | (0.191) | (0.373) | (0.299) |
| Industry Median Leverage | -0.119 | -0.073 | 1.235 | -1.508* |
| | (0.551) | (0.730) | (0.908) | (0.863) |
| Constant | -2.333* | -4.881*** | -3.863*** | 0.094 |
| | (1.308) | (0.892) | (0.936) | (1.248) |
| Number of Observations | 559 | 559 | 559 | 559 |
| Pseudo R-squared | 0.12 | 0.16 | 0.06 | 0.19 |

Table 10—Comparison of "pre-crisis" and "post-crisis" price-to-sales multiples: The table reports average price-to-sales multiples across 30 industries (defined by their 2-digit SIC codes) for recorded transactions in SDC for "pre-crisis" period (1995-1997) and for the "post-crisis" period (1998-2000). The *price-to-sales multiple* is the ratio of the price paid for a transaction divided by the book value of sales for the given target. It is then averaged across all transactions in a given industry for each of the two sub-periods considered. The *post-crisis multiple to pre-crisis multiple ratio* for each industry is the ratio of the *price-to-sales multiple* for 1995-1997 to the *price-to-sales multiple* for 1998-2000.

| Industry 2-digit SIC code | Industry average pre-crisis price-to-sales multiple | Industry average post- crisis price-to-sales multiple | post-crisis multiple to pre-crisis multiple ratio |
|---|---|---|---|
| | (1) | (2) | (1) /(2) |
| 8 | 2.261 | 6.556 | 2.899 |
| 10 | 4.888 | 3.795 | 0.776 |
| 14 | 4.424 | 5.404 | 1.222 |
| 15 | 3.818 | 0.196 | 0.051 |
| 20 | 3.691 | 1.057 | 0.286 |
| 22 | 4.061 | 0.616 | 0.152 |
| 24 | 10.889 | 0.721 | 0.066 |
| 26 | 0.835 | 1.042 | 1.248 |
| 27 | 3.903 | 1.512 | 0.387 |
| 28 | 3.244 | 3.118 | 0.961 |
| 30 | 8.958 | 4.487 | 0.501 |
| 32 | 6.846 | 2.552 | 0.373 |
| 33 | 2.160 | 0.729 | 0.338 |
| 34 | 2.489 | 1.648 | 0.662 |
| 35 | 0.938 | 0.244 | 0.260 |
| 36 | 1.908 | 0.945 | 0.495 |
| 37 | 1.042 | 0.476 | 0.457 |
| 39 | 0.449 | 1.139 | 2.537 |
| 44 | 4.905 | 1.119 | 0.228 |
| 45 | 0.287 | 0.547 | 1.907 |
| 48 | 4.409 | 4.129 | 0.937 |
| 49 | 8.002 | 3.030 | 0.379 |
| 50 | 0.431 | 0.795 | 1.844 |
| 54 | 1.626 | 0.169 | 0.104 |
| 55 | 1.098 | 0.037 | 0.034 |
| 59 | 5.833 | 0.690 | 0.118 |
| 70 | 8.032 | 3.253 | 0.405 |
| 73 | 14.506 | 17.211 | 1.186 |
| 79 | 4.905 | 2.970 | 0.605 |
| 87 | 4.558 | 4.334 | 0.951 |
| All industries | 4.180 | 2.484 | 0.594 |

Table 11—Robustness checks on determinants of response choice for distressed firms only: A firm is defined to be financially distressed if during 1997-2000, the company had (any) two consecutive years with earnings before interest, taxes, depreciation and amortization (EBITDA) less than its reported interest expense or, in any one year, EBITDA was less than 80% of the firm's interest expense. The dependent variable in models (1) and (2) is an indicator equal to 1 if a company undertook a debt workout during 1998-2000, and zero otherwise. Workout is defined as an agreement by the firms' creditors to modify any terms of an outstanding financial claim currently held against the firm (for both public and private loan agreements). In Models (3) and (4), the dependent variable is an indicator equal to 1 if a company undertook an asset sale during 1998-2000, and zero otherwise. *Asset Sale* includes news items that record both sales of assets and divestitures in subsidiaries or divisions in order to retire debt. Data on asset sales comes from two sources: (1) information concerning sales of assets reported in the *Troubled Company Reporter*, and this is integrated with (2) data from *SDC Platinum*™ which records information on the divestitures of subsidiaries. In models (5) and (6), the dependent variable is an indicator equal to 1 if a company opted for a merger or was taken over, and zero otherwise. In models (7) and (8), the dependent variable is an indicator equal to 1 if a company was liquidated, and zero otherwise. The definitions of the regressors are the same as in Tables 3 and 4. Robust standard errors, corrected for country-level clustering, are reported in parentheses below the marginal effects; ***, **, * indicate significance at 1-, 5- and 10-percent levels, respectively.

| Response type: | Workouts | | Asset sales | | Mergers | | Liquidations | |
|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| Leverage | 0.718*** | 0.747*** | 0.303** | 0.258* | 0.108 | 0.096 | 0.102 | 0.039 |
| | (0.137) | (0.156) | (0.140) | (0.148) | (0.154) | (0.145) | (0.088) | (0.037) |
| [(Int. Expense – EBITDA) / Int. Expense] | -0.00028 | -0.00036 | -0.000025 | -0.000025 | -0.000004 | -0.0000003 | -0. 00023 | -0.0001 |
| | (0.001) | (0.001) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| Mkt. Value/ Book Ratio | -0.238*** | -0.247*** | -0.136** | -0.119** | -0.034 | -0.035 | -0.047 | -0.027 |
| | (0.052) | (0.062) | (0.056) | (0.060) | (0.033) | (0.027) | (0.050) | (0.032) |
| Collateral | 0.104 | 0.086 | -0.017 | -0.004 | 0.294*** | 0.305*** | -0.147 | -0.075 |
| | (0.158) | (0.157) | (0.063) | (0.071) | (0.083) | (0.085) | (0.118) | (0.064) |
| Log (Mkt. capital) in USD | 0.209*** | 0.218*** | 0.149*** | 0.142*** | 0.052 | 0.050 | -0.004 | -0.007 |
| | (0.068) | (0.067) | (0.047) | (0.048) | (0.057) | (0.058) | (0.008) | (0.005) |
| Return on Equity | 0.0001 | 0.00021 | 0.00039 | 0.00029 | 0.00025** | 0.00024* | -0. 00005 | -0.000046 |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| Group | 0.046 | | -0.064 | | 0.012 | | -0.032 | |
| | (0.081) | | (0.084) | | (0.026) | | (0.033) | |
| Largest block-holder concentration | | 0.002 | | -0.002* | | -0.002*** | | -0.002 |
| | | (0.003) | | (0.001) | | (0.001) | | (0.001) |
| Politically connected | 0.035 | 0.027 | 0.025 | 0.034 | -0.024 | -0.012 | -0.023*** | -0.009* |
| | (0.134) | (0.112) | (0.061) | (0.062) | (0.058) | (0.063) | (0.009) | (0.005) |
| Industry Median MB Ratio | -0.192 | -0.169 | 0.190*** | 0.185*** | 0.190 | 0.197 | -0.007 | -0.025 |
| | (0.330) | (0.380) | (0.070) | (0.065) | (0.212) | (0.204) | (0.047) | (0.048) |
| Industry Median Leverage | -0.261 | -0.268 | 0.195** | 0.195** | 0.447** | 0.434** | -0.121 | -0.058 |
| | (0.323) | (0.307) | (0.096) | (0.088) | (0.179) | (0.184) | (0.123) | (0.065) |
| Observations | 265 | 265 | 265 | 265 | 265 | 265 | 265 | 265 |
| Pseudo R-squared | 0.11 | 0.12 | 0.17 | 0.17 | 0.09 | 0.10 | 0.18 | 0.29 |